BROOKHAVEN
NATIONAL LABORATORY

Work Permit # S2005-054
Work Order # ____
Job# ____ **Activity#** ____

1. Work requester fills out this section. ☐ **Standing Work Permit**

Requester: Don Lynch	Date: 2/14/05	Ext.: 2253	Dept/Div/Group: PO/PHENIX
Other Contact person (if different from requester): S. Marino			Ext.: 3704
Work Control Coordinator: Don Lynch		Start Date: 2/16/05	Est. End Date: 4/1/05
Brief Description of Work: Remove, Modify & Replace Power Supply Modules on Drift Chamber on West Carriage			
Building: 1008	Room: IR	Equipment: N/A	Service Provider: PHENIX

2. WCC, Requester/Designee, Service Provider, and ES&H (as necessary) fill out this section or attach analysis

ES&H ANALYSIS

Radiation Concerns	☒ None	☐ Activation	☐ Airborne	☐ Contamination	☐ Radiation	☐ Other
☐ Special nuclear materials involved, notify Isotope Special Materials Group				☐ Fissionable materials involved, notify Laboratory Criticality Officer	
Safety Concerns	☐ None	☐ Ergonomics		☐ Transport of Haz/Rad Material	
☐ Adding/Removing Walls or Roofs	☐ Confined Space*	☐ Explosives		☐ Lead*	☐ Penetrating Fire Walls
	☐ Corrosive	☐ Flammable		☐ Magnetic Field*	☐ Pressurized Systems
☐ Asbestos*	☐ Cryogenic	☐ Fumes/Mist/Dust*		☐ Material Handling	☐ Rigging/Critical Lift
☐ Beryllium*	☐ Electrical	☐ Heat/Cold Stress		☐ Noise*	☐ Toxic Materials*
☐ Biohazard*	☒ Elevated Work*	☐ Hydraulic		☐ Non-ionizing Radiation*	☐ Vacuum
☐ Chemicals*	☐ Excavation	☐ Lasers*		☐ Oxygen Deficiency*	☐ Other
* Does this work require medical clearance or surveillance from the Occupational Medicine Clinic? ☐ Yes ☒ No					
Environmental Concerns		☒ None		☐ Work impacts Environmental Permit No.	
☐ Atmospheric Discharges (rad/non-rad)		☐ Land Use		☐ Soil activation/contamination	☐ Waste-Mixed
☐ Chemical or Rad Material Storage or Use		☐ Liquid Discharges		☐ Waste-Clean	☐ Waste-Radioactive
☐ Cesspools (UIC)		☐ Oil/PCB Management		☐ Waste-Hazardous	☐ Waste-Regulated Medical
☐ High water/power consumption		☐ Spill potential		☐ Waste-Industrial	☐ Underground Duct/Piping
Waste disposition by:					☐ Other
Pollution Prevention (P2)/Waste Minimization Opportunity:		☒ None ☐ Yes			
FACILITY CONCERNS	☒ None				
☐ Access/Egress Limitations	☐ Electrical Noise	☐ Potential to Cause a False Alarm			☐ Vibrations
	☐ Impacts Facility Use Agreement			☐ Temperature Change	☐ Other
☐ Configuration Control	☐ Maintenance Work on Ventilation Systems			☐ Utility Interruptions	

WORK CONTROLS

Work Practices

☐ None	☐ Exhaust Ventilation	☒ Lockout/Tagout	☐ Spill Containment	☐ Security (see Instruction Sheet)
☒ Back-up Person/Watch	☐ HP Coverage	☐ Posting/Warning Signs	☐ Time Limitation	☐ Other
☐ Barricades	☐ IH Survey	☐ Scaffolding-requires inspection	☐ Warning Alarm (i.e. "high level")	

Protective Equipment

☐ None	☐ Ear Plugs	☐ Gloves	☐ Lab Coat	☐ Safety Glasses	
☐ Coveralls	☐ Ear Muffs	☐ Goggles	☐ Respirator	☒ Safety Harness	
☐ Disposable Clothing	☐ Face Shield	☐ Hard Hat	☐ Shoe Covers	☒ Safety Shoes	☐ Other

Permits Required (Permits must be valid when job is scheduled.)

☒ None	☐ Cutting/Welding	☐ Impair Fire Protection Systems
☐ Concrete/Masonry Penetration	☐ Digging/Core Drilling	☐ Rad Work Permit-RWP No
☐ Confined Space Entry	☐ Electrical Working Hot	☐ Other

Dosimetry/Monitoring

☒ None	☐ Heat Stress Monitor	☐ Real Time Monitor	☐ TLD
☐ Air Effluent	☐ Noise Survey/Dosimeter	☐ Self-reading Pencil Dosimeter	☐ Waste Characterization
☐ Ground Water	☐ O_2/Combustible Gas	☐ Self-reading Digital Dosimeter	☐ Other
☐ Liquid Effluent	☐ Passive Vapor Monitor	☐ Sorbent Tube/Filter Pump	

Training Requirements (List below specific training requirements) PHENIX AWARENESS, RWIC ACCESS
Lockout/Tagout affected ; working @ heights

Based on analysis above, the Walkdown Team determines the risk, complexity, and coordination ratings below:				**If using the permit when all hazard ratings are low, only the following need to sign: (Although allowed, there is no need to use back of form)**	
ES&H Risk Level:	☐ Low	☑ Moderate	☐ High	WCC:	Date:
Complexity Level:	☐ Low	☑ Moderate	☐ High	Service Provider:	Date:
Work Coordination:	☐ Low	☑ Moderate	☐ High	Authorization to start	Date:
				(Departmental Sup/WCC/Designee)	

3. Both work requester and service provider contribute to work plan (use attachments for detailed plans)

Work Plan (procedures, timing, equipment, and personnel availability need to be addressed): SEE ATTACHED
Special Working Conditions Required: No
Operational Limits Imposed: No
Post Work Testing Required: No
Job Safety Analysis Required: ☐ Yes ☑ No — Walkdown Required: ☐ Yes ☑ No

Reviewed by: Primary Reviewer will determine the size of the review team and the other signatures required based on hazards and job complexity. Primary Reviewer signature means that the hazards and risks that could impact ES&H have been identified and will be controlled according to BNL requirements.

Title	Name (print)	Signature	Life #	Date
Primary Reviewer	J. Scott	[signature]	13175	2/14/05
ES&H Professional	P. Genighan	[signature]	21868	2/14/05
Other	C PEARSON	C Pearson	15245	2/14/2005
~~Other~~ Super Backup-Watch				
Work Control Coordinator	D. Lynch	[signature]	20146	2/14/2005
Service Provider				
	Review Done: ☑ in series	☐ team		

4. Job site personnel fill out this section.

Note: Signature indicates personnel performing work have read and understand the hazards and permit requirements (including any attachments).

Job Supervisor: [signature] 15767		Contractor Supervisor:	
Workers: V. Pavtulyev	Life#: P6221	Workers :	Life#:
V. Riabov	R6445		

Workers are encouraged to provide feedback on ES&H concerns or on ideas for improved job work flow. Use feedback form or space below.

5. Departmental Job Supervisor, Work Control Coordinator/Designee

Conditions are appropriate to start work: (Permit has been reviewed, work controls are in place and site is ready for job.)

Name:	Signature:	Life#:	Date:

6. Departmental Job Supervisor, Work Requester/Designee determines if Post Job Review is required. ☐ Yes ☐ No

Post Job Review (Fill in names of reviewers)

Name:	Signature:	Life#:	Date:
Name:	Signature:	Life#:	Date:

7. Worker provides feedback.

Worker Feedback (use attached sheets as necessary)

a) WCM/WCC: Is any feedback required? ☐ Yes ☐ No

b) Workers: Are there better methods or safer ways to perform this job in the future? ☐ Yes ☐ No

8. Closeout: Work Control Coordinator (authorizing dept.) checks quality of completed permit and ensures the work site is left in an acceptable condition. (WCC can delegate clean up of work area to work supervisor)

Name:	Signature:	Life#:	Date:
Comments:			

Attachment toW.P. # S 2005 -054 **Feb. 14, 2005**

Drift Chamber repair in the PHENIX Experimental Hall (bldg. 1008).

Problem

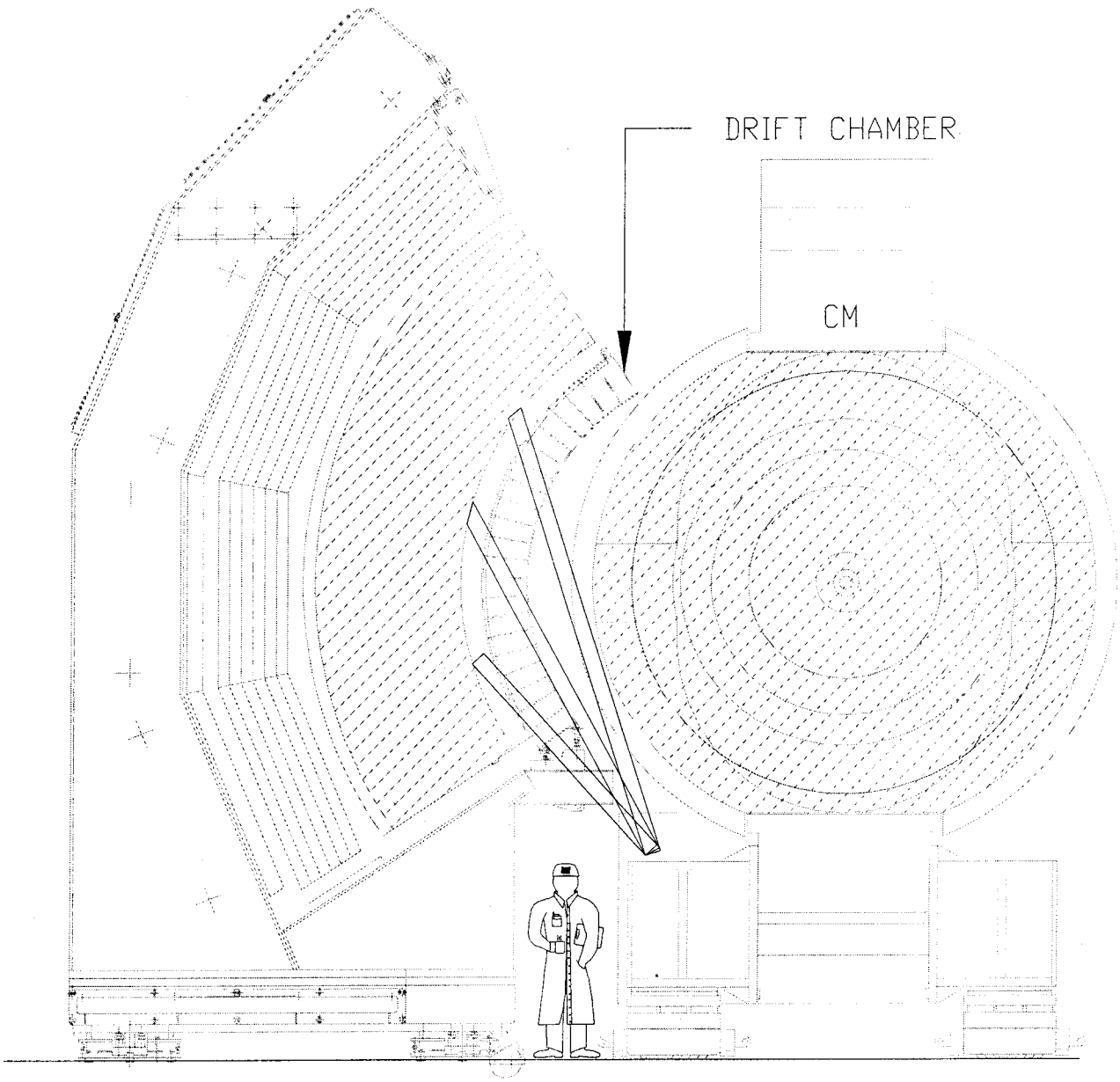
The unmodified FEM power supply modules on the west Drift Chamber have been failing at an unacceptable rate. This is by now a well-understood problem. Modifications made to the modules on the east carriage, and to some earlier failed units on the west, have proven successful in preventing failures. The remaining modules on the west need to be modified. The intent is to trouble shoot these during an access period between now and April, 2005, and modify/replace them as appropriate.
Access to the installed location of the modules is difficult, as they are located 10 to 20 feet above track level, tucked inside the arc formed by the RICH detector, with the Central Magnet in front of the west carriage. The procedure developed below was used successfully in the past to remove quite a few failed modules.

Work Plan

This work is to be done by fully trained and experienced personnel during an access period. Access to the power supply modules is by extension ladders set up between the central magnet (CM) outrigger and the RICH vessel on the west carriage. For the higher modules, two ladders will be secured side-by-side, tied together, to allow climbing by the CM pole piece. All detectors in the IR will contain flammable gas during this operation. There is no access to the DC, PC, or TEC gas windows from the location of the ladders and no danger of damage to the gas volume from their installation. The Drift Chamber high and low voltage will be turned off. The 12-ton building crane will be positioned such to place the eye of a sling directly above the work area, then locked out. A harness will be worn and clipped to the sling while the work is being performed. A watch must be present at all times when someone is up on the ladders. All work in the IR will be supervised by Sal Marino.

Work will involve trouble shooting of the modules, and repair or replacement as appropriate.

- Ensure that power to the DC electronics is secured and that the CM power key is locked out of use.
- Erect and secure 1 (or 2 side by side if necessary) extension ladders between the top of the central magnet outrigger and the rich detector.
- Set up a tie off point just above the working position using the building crane and an adequately rated sling.
- The position of the tie off point is to be set for each working level and the crane must be locked out before the worker ascends the ladder.
- The worker is to use a body harness with a short clip-on lanyard and tie off before starting work.
- A watch must be present at all times when a person is on the ladders
- Remove or reinstall power supply modules as necessary.


DRIFT CHAMBER
CM